CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1.   A method of filling containers with product, comprising:

assigning variables associated with at least one container and a number of drop points;

determining at least one threshold value based on the variables; and

distributing the product within the at least one container for each drop point based on the determined at least one threshold value.

2.   The method of claim 1, wherein the variables include at least one of:

$A =$ Minimum fill value where the at least one container would be considered full;

$B =$ Maximum fill value or maximum capacity of the at least one container;

$C =$ Minimum number of product in the at least one container to be considered full;

9   D = Maximum number of average product the at least one

10   container can hold; and

11   W = number of drop points.

1   3. The method of claim 1, wherein:

2   if one of the at least one threshold value is exceeded, the product

3 amount is decremented;

4   if the one threshold value is not exceeded, then a determination is

5 made as to whether another container is required.

1   4. The method of claim 1, wherein if one of the at least one threshold

2 value is not exceeded, substantially uniformly distributing the product

3 throughout all of the containers of the at least one container within a

4 particular drop point by averaging the product over the drop point for each

5 container fill.

1   5. The method of claim 4, further comprising:

2   setting a counter to look at a next possible container associated

3 with the drop point and determining whether the next possible container is

4 required, if the next container is not required, adjusting the variables to

5 determine if any of the product can be forced into a previous container.

6. The method of claim 1, wherein the determining step includes:

    determining at least one of:

        a = total thickness of all product;

        b = total number of all product;

        Z = thickness of each product and an order of drop;

    determining a best estimate of a number of containers needed if a level of fill varies between a maximum and minimum fill value of the at least one container; and

    determining a best estimate of a number of containers needed if the number of product varies for the drop point.

7. The method of claim 6, wherein:

    the determining a best estimate of the number of containers needed if the level of fill varies between the maximum and minimum fill value includes:

        providing an average between (i) a number of containers if all of the containers of the at least one container are filled to the maximum fill value and (ii) the number of containers if all of the containers are filled to the minimum fill value; and

9	the determining a best estimate of the number of containers of the
10	at least one container needed if the number of product varies for the drop
11	point includes:
12	providing an average between (i) a number of containers of
13	the at least one container if all of the containers are filled with the
14	maximum number of product and (ii) the number of containers if all of the
15	containers are filled to the minimum number of product.

1	8. The method of claim 7, further comprising providing a starting
2	container fill number, the starting container fill number being the number
3	of product associated with the drop point divided by a number of product
4	for the drop point.

1	9. The method of claim 1, further comprising building a fill table defining
2	an amount of product to be placed in the at least one container, the fill
3	table being created by:
4	
5	calculating a best estimate of containers needed if a level of
6	fill varies between a maximum fill value and a minimum fill value and a
7	number of product varies;

8   calculating an expected number of the containers needed

9   for a drop point based on the calculated best estimate;

10   determining a number of product required per container for

11   the drop point based on the number of product and the expected number of

12   the containers for the drop point; and

13   determining whether a fill depth is less than or equal to the

14   maximum fill value of the at least one container.

1   10. The method of claim 1, wherein the determining step further includes

2   determining an expected number of containers of the at least one container

3   required for the drop point.

1   11. The method of claim 1, wherein the determining step includes:

2   determining whether a fill depth of the at least one container is less

3   than or equal to a maximum fill value of the container;

4   if so, determining whether the at least one container count is less

5   than an expected fill count;

6   if not less, determining whether a total number of product and each

7   thickness thereof for a particular drop point is less than or equal to the

8   number of drop points; and

9   if so, then distributing the product into the at least one container

10   for the drop point.

1   12. The method of claim 11, wherein when the at least one container

2   count is less than or equal to an expected fill count, adjusting the variables

3   to determine how many product must be removed from the at least one

4   container.

1   13. The method of claim 1, wherein the product are mail pieces.

1   14. A method for distributing product at a drop point, comprising the

2   steps of:

1   calculating a best estimate of containers needed if a level of fill

2   varies between a maximum fill value and a minimum fill value and a

3   number of product varies;

4   calculating an expected number of the containers needed for a drop

5   point based on the calculated best estimate;

6   determining a number of product required per container for the

7   drop point based on the number of product and the expected number of

8   containers for the drop point;

9   determining whether a fill depth of the containers is less than or

10   equal to the maximum fill value of the containers; and

11   if the determining step of fill depth is less than or equal to the

12   maximum fill value, creating a container fill table having a drop point

13   designation, and an associated number of containers and product to fill the

14   containers.

1   15. The method of claim 14, further comprising providing values to

2   calculate the best estimate and the expected number of containers, the

3   values includes at least one of:

4          $A =$ Minimum fill value where a container of the containers

5   would be considered full;

6          $B =$ Maximum fill value or maximum capacity of the container;

7          $C =$ Minimum number of pieces in a container to be considered

8   full;

9          $D =$ Maximum number of average pieces the container can

10   hold;

11         $W =$ Maximum number of drop points;

12          $a =$ total thickness of all product; and

13          $b =$ total number of all product.

1 16. The method of claim 15, wherein:

2   the calculating a best estimate of containers needed if a level of fill

3 varies between a maximum fill value and a minimum fill value includes:

4   (i)   a/B and using a next higher integer;

5   (ii)   a/A and using next lower integer; and

6   (iii)   ((i) + (ii))/2; and

7   the calculating a best estimate of containers needed if a number of

8 fill varies between the maximum fill value and a minimum fill value

9 includes:

10   (a)   b/D using a next higher integer;

11   (b)   b/C and using a next lower integer; and

12   (c)   ((a) + (b))/2.

1 17. The method of claim 15, further comprising determining whether a

2 container count is less than or equal to the expected number of containers

3 for the drop point and if so adjusting piece count of the product for the

4 container.

1 18. The method of claim 15, further comprising filling the containers

2 based on product and container allocation in the container fill table.

1   19. The method of claim 14, wherein the product is at least one mail

2   piece.

1   20. A method comprising :

2   retrieving thickness data and count data on pieces to be placed in

3   containers;

4   computing a number of containers required for the pieces based on

5   an average of minimum and maximum fill capacities based on fill depth

6   and fill count of the containers;

7   calculating a final container count by taking an average of the

8   computing step.

1   21. The method of claim 20, further comprising computing the number of

2   pieces in each container based on final container count and total piece

3   count.

1   22. The method of claim 21, further comprising:

2   testing that specific pieces going in each container does not overfill

3   a maximum capacity of the container based on volume; and

4   if so, adjusting the specific piece count.

1   23. A system comprising:

2   means for assigning variables associated with at least one container

3   and a number of drop points;

4   means for determining at least one threshold value based on the

5   variables; and

6   means for distributing the product within the at least one container

7   for each drop point based on the determined at least one threshold value.

1   24.   A machine readable medium containing code for filling containers

2   with product, comprising:

3   a module for assigning variables associated with at least one

4   container and a number of drop points;

5   a module for determining at least one threshold value based on the

6   variables; and

7   a module for distributing the product within the at least one

8   container for each drop point based on the determined at least one

9   threshold value.